jTerm: An Open Source Terminology Server

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Background: The consistent semantic transmission of clinical data between systems, and from system to user, is a key requirement for clinical information systems. The use of terminology servers to provide this functionality has been well articulated (1, 2). We describe here an open source terminology server for use in clinical infrastructures.

Motivation: jTerm was the result of a need by one of the authors (MAH) to navigate multiple different terminologies and coding system and to do so through a single application. This was a proverbial "itch to be scratched" that often results in an open source software project. The primary goals for jTerm are (1) provide a cross-platform terminology **query** server supporting a common set of "terminological queries" and (2) to implement the multi-terminology querying using a uniform mechanism.

Why open source? The decision to make the system open source was made at the outset and based on two considerations: (1) the desire to make the software available without constraints on its re-distribution, even for commercial repackaging; and (2) the need to increase the number of developers.

Information Model: In order to accommodate multiple terminological and coding systems in the same environment, we implemented a generic information model previously described (3). This multi-terminology capable generic model is implemented in middle-tier object model using the Java language.

Architecture: jTerm is an n-tier J2EE server based application with a relational database server as persistent storage. Like the UMLS KSS, jTerm uses HTTP as the connection protocol for external systems. We chose to implement a URL-based query mechanism, a similar strategy to that used by NCBI Entrez. Queries take the form of a URL invoking a specific CGI process (Java servlet). Reponses from the server are sent back to the requesting system in XML format.

Development history: jTerm version 1.0 was released in November of 2001. Since then, the system has been versioned three times with significant re-architecting at each version. Although the project has a Web site and has been in available for three years, it has not garnered significant interest from potential contributing developers. We hypothesize "vertical" software, such as medical terminology servers, are unlikely to result in a high number of co-developers due to the specialized nature of the application and the low prevalence of open source programmatic support within the healthcare IT domain. In our experience, the 'user' interest in jTerm has been motivated primarily by a low-cost terminology server solution rather than the need to customize or commercially re-distribute the system.

Current use: jTerm is currently in use as a system component in the Human Brain Project research conducted at UC Davis. We do not currently monitor downloads or installations of jTerm so it is possible that it has wider use. JTerm can be downloaded from:
http://informatics.ucdavis.edu/jterm

Future directions: Our future plans are to enable integration between jTerm and various "ontology" editors, in particular Protégé 2000 and OILed. We also plan to base the next version of the concept-model (ontology component) on the emerging OWL specification(4).

References:
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